PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/003252	26.03.2004	

International Patent Classification (IPC) or both national classification and IPC
C08L23/06, C08L23/08

Applicant
BOREALIS TECHNOLOGY OY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2004/003252

10/594359

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was field, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. II Priority

1. ☒ The following document has not been furnished:

   ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

   ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

   Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-10
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

   and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Box I

1. The following documents are referred to in the present opinion; the numbering will be adhered to the entire procedure

D1 WO-A-02/34829
D2 EP-A-1359192
D3 WO-A-02/102891
D4 EP-A-1359191
D5 EP-A-1460105

Box V

2. Present claims 1-10 do not appear to be novel in the sense of Art. 33(2) PCT

2.1 Subject matter of claim 1 is a bimodal polyethylene resin for pipes of MI_5 0.1-0.22 g/10 min, d>.952 g/cm^3 of
(A) 45-55% low molecular weight polyethylene
(B) 55-45% high molecular weight polyethylene

2.2 The subject matter of claim 1 is disclosed in
D1, comparative example 19
D2, example 6
D3, example 9R in combination with page 4, line 8-12

2.3 D4, example 5, discloses a blend of 54% of low molecular weight polyethylene, d=.9735 g/cm^3, MI_2=359.1 and 48% high molecular weight polyethylene, d=.9242 g/cm^3. The resulting blend has a MI_5=0.25 g/10 and d=.9534 g/cm^3.

Example 5 of D4 is regarded as novelty destroying for present claim 1 even though the resulting blend has not the same melt index MI_5 as claimed in present claim 1.

MI_5 and density of the resulting blend are not only dependant on the bimodal polymer, but in a composition comprising a polymer, they can be adjusted by other, non-essential components like fillers (see D5, table 2 and 3). Clear essential technical features of the present bimodal blend is only the ratio of the two fractions, i.e. 45:55-55:45. This feature is disclosed by D4, i.e. D4 is novelty destroying for the present claim

(Art 33(2) PCT). If the applicant is of the opinion, that D4 differs from the present claim, the claim is apparently lacking other essential technical features. Consequently it is unclear (Art. 6 PCT) and insufficiently disclosing the invention (Art 5 PCT). From only the disclosure of the ratio of two polymers, it seems to be impossible for a skilled man to solve the technical problem, i.e. reduced sagging, even if other parameters of the resulting resin blend are disclosed, since he does not know which properties the resin fractions have to have to obtain the resulting resin blend .

2.4 The subject matter of claims 2-10 is disclosed in D1-D4 and hence not novel

3. The present claims 1-10 do not appear to be inventive in the sense of Art. 33(3) PCT

If example 5 of document D4 would be regarded as closest prior art, the only distinguishing feature is MI_5. The problem resulting from the choice of MI_5 is the reduction of sagging. However, the solution, to choose a polymer of reduced melt index, is obvious to a skilled man: it is general knowledge for the skilled man that a polymer with lower melt index will have less sag (as can be seen from the method of measurement of the melt index)

Box VI

4. Table 2 of D5, which was published after the priority date of the present application on 22.9.2004, discloses the bimodal polyethylene resin of present claims 1-10

Box VIII

5. Claims 1, 4, 5 and 8 are unclear in the sense of Art. 6 PCT

5.1 The terms "low" and "high" in claim 1 are unclear. They are insufficient to distinguish the two molecular weight fractions from each other

5.2 The standard of measurement of the melt index in claims 1 and 8, the dynamic viscosity in claim 4 and the shear thinning in claim 5 are not disclosed in the claims